

# ABSTRACT

A mass spectrometer that includes an ion source, an ion trap, and a light detection module. The ion trap has two end-cap electrodes and a ring electrode. The ring electrode is positioned relative to the end-cap electrodes to confine a charged particle from the ion source within a confinement region when an audio frequency voltage having a first amplitude is applied between the ring electrode and the two end-cap electrodes. The charged particle is ejected from the ion trap when the audio frequency voltage increases to a second amplitude. The light detection module includes a light source that illuminates the ejected particle and a light detector that detects light scattered from the ejected particle.

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